MIL-D-40030A
8 JUNE 1960
SUPERSEDING
MIL-D-40030 (CmlC)
6 JUNE 1958

MILITARY SPECIFICATION

DRUMS, PLASTIC, MOLDED POLYETHYLENE

This specification has been approved by the Department of Defense and is mandatory for use by the Departments of the Army, the Navy, and the Air Force.

1. SCOPE

1.1 **Scope.** This specification covers Interstate Commerce Commission 2S molded polyethylene drums. These drums are used for liquids, powders, and pastes (see 6.1).

1.2 **Classification.** The polyethylene drums covered by this specification shall be of the following styles, sizes, and classes as specified (see 6.2):

Style A — Cubical.
- Size 1 — 5-gallon nominal capacity.

Style B — Cylindrical.
- Size 1 — 5-gallon nominal capacity.
- Size 2A — 15-gallon nominal capacity.
- Size 2B — 15-gallon nominal capacity.
- Size 3 — 30-gallon nominal capacity.
- Size 4 — 55-gallon nominal capacity.

2. APPLICABLE DOCUMENTS

2.1 **Government documents.** The following documents, of the issue in effect on date of invitation for bids, form a part of this specification:

SPECIFICATIONS

FEDERAL

L-P-590 — Plastic Compounds, Molding and Extrusions, Polyethylene.

PPP-B-636 — Boxes, Fiber.

STANDARDS

MILITARY

MIL-STD-105 — Sampling Procedures and Tables for Inspection by Attributes.

MIL-STD-129 — Marking for Shipment and Storage.

PUBLICATIONS

Screw-Thread Standards for Federal Services — Handbook H28.

FSC 8110

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification. Unless otherwise specified the issue in effect on date of invitation for bids shall apply.

AMERICAN SOCIETY FOR TESTING MATERIALS

D1238–57T — Method of Test for Measuring Flow Rates of Thermoplastics by Extrusion Plastometer (Tentative).

D775–47 — Method of Drop Test for Shipping Containers.

D997–50 — Method of Drop Test for Cylindrical Shipping Containers.

(Copies of ASTM publications may be obtained from the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.)

INTERSTATE COMMERCE COMMISSION

49 CFR 71–90 — Interstate Commerce Commission Rules and Regulations for the Transportation of Explosives and Other Dangerous Articles.

(The Interstate Commerce Commission regulations are now a part of the Code of Federal Regulations (Rev. 1956) available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Orders for the above publication should cite "49 CFR 71–90 (Rev. 1956.")

OFFICIAL CLASSIFICATION COMMITTEE

Uniform Freight Classification Rules.

(Application for copies should be addressed to the Official Classification Committee, 1 Park Ave. at 33d St., New York 16, N. Y.)

3. REQUIREMENTS

3.1 Materials. The drum shall be made of natural color polyethylene containing no copolymers and conforming to type I, grade 2 of Specification L–P–590. The polyethylene shall have a maximum melt index value of 2.6 grams per 10 minutes when tested in accordance with ASTM method D1238–57T. When specified 5 ± 1 percent by weight of polyisobutylene or a butyl rubber, having essentially no unsaturation, shall be added to the polyethylene (see 6.2 and footnote 1, table III).

3.2 Manufacture.

3.2.1 *Construction.* The drum shall be molded in one piece. The dimensions of style A and B drums shall be specified in tables I and II, respectively.

3.2.2 *Closures.*

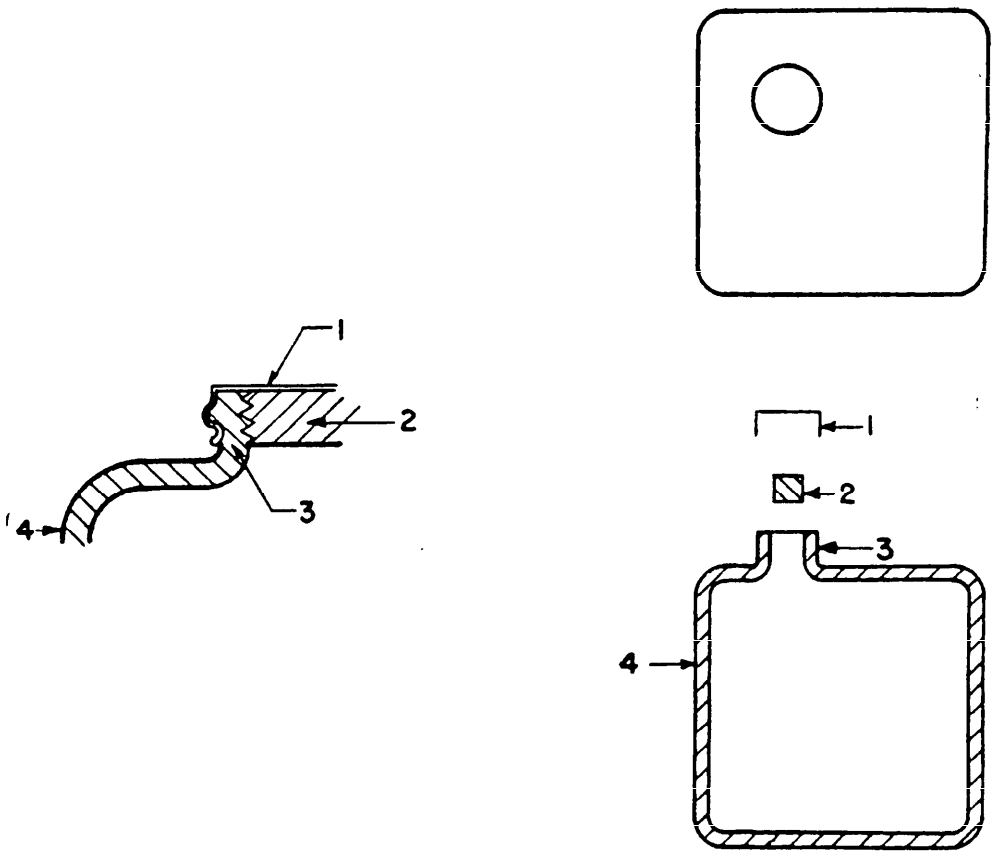
3.2.2.1 *Flanges.* The flanges shall be integrally molded with the drum and shall be threaded internally to accommodate a polyethylene plug. Size 1 drums shall have one flanged opening. Size 2, 3, and 4 drums shall have two flanged openings.

TABLE I. *Dimensions of cubical drum (see fig. 1)*

Outside body height (excluding flange)	10¾ ± 3/32 inch.
Outside body width	10¾ ± 3/32 inch.
Outside body length	10¾ ± 3/32 inch.
Flange height	7/8 ± 3/32 inch.
Flange outside diameter	83-mm. (to fit 83-mm. screwcap 400 finish)
Flange inside diameter	2-inches (nominal) (see 3.2.2.1).
Sidewall, bottom and top head thickness	1/16 inch (min.)

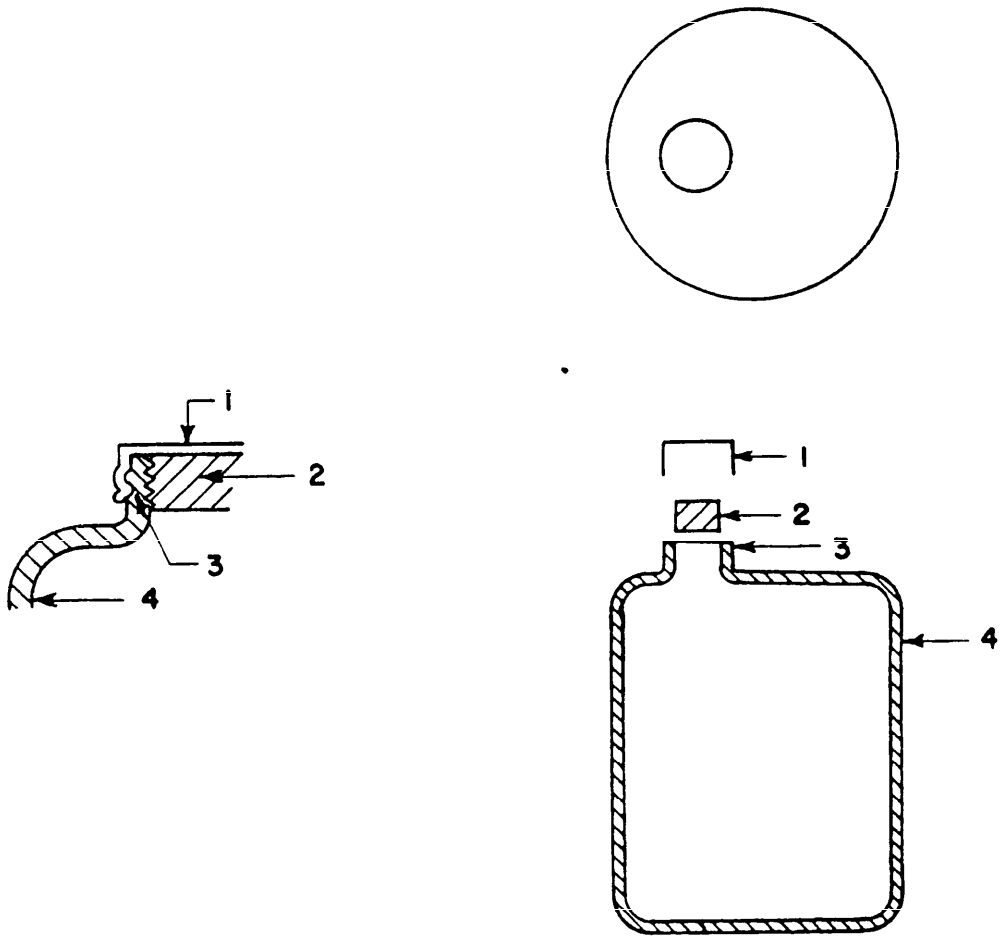
TABLE II. *Dimensions of cylindrical drums*
(in inches unless otherwise indicated)

	Size 1 (see fig. 2)	Size 2A (see fig. 3)	Size 2B (see fig. 3)	Size 3 (see fig. 3)	Size 4 (see fig. 3)
Outside diameter	11 ± 3/32	14 5/8 ± 3/32	18 3/4 ± 3/32	18 ± 3/32	22 1/4 ± 3/32
Outside height (excluding flange)	13 3/8 ± 3/32	20 1/8 ± 3/32	24 3/8 ± 3/32	27 3/16 ± 3/32	32 1/4 ± 3/32
Sidewall, bottom, and top head thickness (min.)	1/16	1/16	1/16	1/16	1/16
Flange inside diameter	2-inch (nominal) (see 3.2.2.1)				
Flange outside diameter	To fit 83-mm cap 400 finish.				



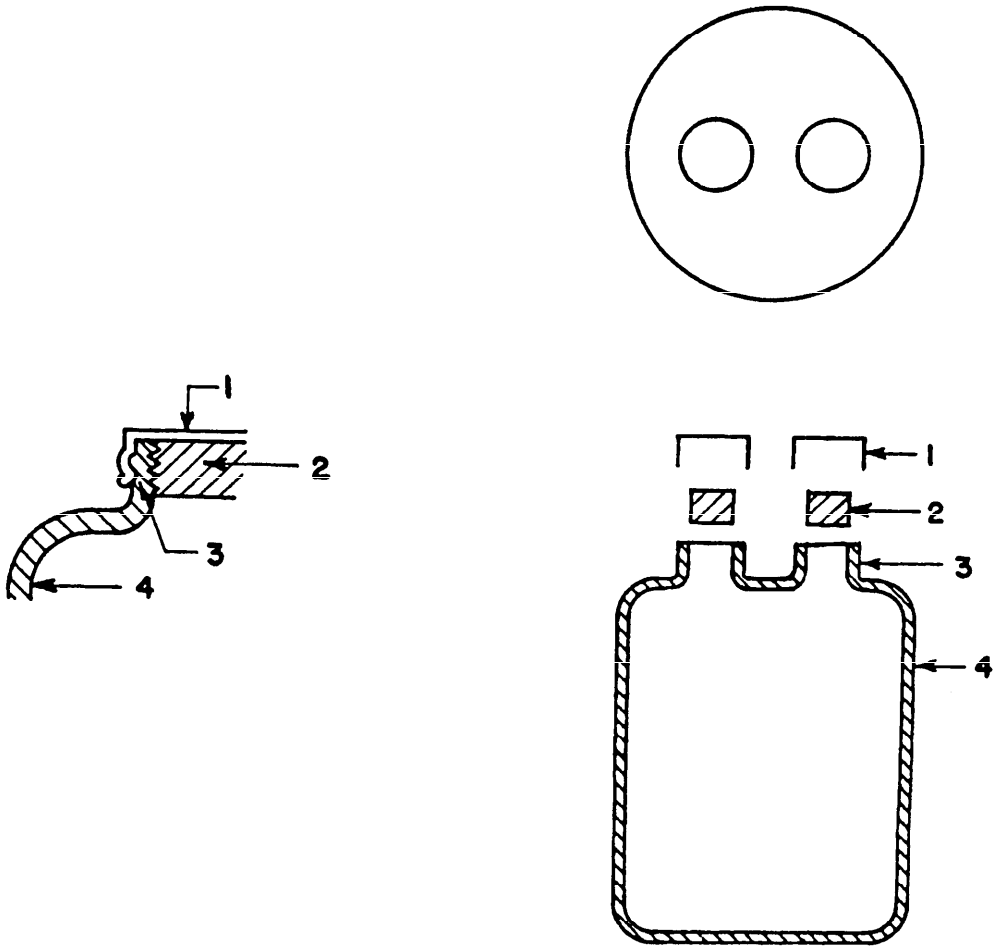
1. OUTER CAP
2. PLUG
3. FLANGE
4. DRUM

FIGURE 1. *Style A—size 1.*



1. OUTER CAP
2. PLUG
3. FLANGE
4. DRUM

FIGURE 2. *Style B—size 1.*



1. OUTER CAP
2. PLUG
3. FLANGE
4. DRUM

FIGURE 3. *Style B—2A, 2B, 3, 4.*

3.2.2.1.1 *Internal threads.* Unless otherwise specified, the flanges shall be threaded internally with 2-inch (nominal) buttress-type threads (major diameter $2\frac{9}{16} \pm \frac{1}{16}$ inch, minor diameter $2\frac{11}{32} \pm \frac{1}{16}$ inch). Alternatively, if specified by the contract or order, internal threads shall be 2-inch (nominal) American Straight Pipe threads (NPSM) conforming to Federal Services — Handbook H28 for Screw-Thread Standards. If specified, size 2, 3, and 4 drums shall have one 2-inch and one ¾-inch opening in lieu of two 2-inch openings. All ¾-inch openings shall be internally threaded with NPSM threads.

3.2.2.1.2 *External threads.* All 2-inch flanged openings shall be externally threaded to accommodate a 400-finish, 83-mm. cap. All ¾-inch flanged openings shall be externally threaded to accommodate a 400-finish, 43-mm. cap.

3.2.2.2 *Plugs.* Drums shall be provided with polyethylene plugs for each opening. The 2-inch plugs shall be combination plugs or adapters with external buttress threads to fit the internal flange threads and with ¾-inch NPSM internal threads to accommodate a center plug (see fig. 4). The ¾-inch center hole shall have a solid (cutout) seal molded in the base. The seal shall not interfere with the seating of a ¾-inch polyethylene plug, which shall be provided with each combination plug. Combination plugs, with buttress threads, shall be provided with a compressible polyethylene O-ring-type gasket to prevent leakage when tested as specified in 4.5.1. If other than buttress-type threads are specified for the flanged openings (see 3.2.1.1), 2-inch openings shall have solid plugs as specified above except that threads shall be NPSM external threads. All ¾-inch openings shall be supplied with ¾-inch solid plugs. All plugs, combination or solid, shall be constructed so that they may be tightened with a standard plug wrench, and shall not interference with proper placement of the outer caps specified in 3.2.2.3.

3.2.2.3 *Outer cap.* Outer caps shall be provided for each opening. The cap shall be a rigid metal or plastic screw-type closure, which, when handtight, will prevent foreign matter from coming in contact with the polyethylene flanges. Outer caps shall be threaded to fit the external flange threads specified in 3.2.2.1.2.

3.3 **Leakage.** The drum and closures shall not leak when tested as specified in 4.5.1.

3.4 **ICC specification.** Styles A and B drums shall comply with Specification 2S of the Interstate Commerce Commission Regulations.

3.5 **Identification markings.** The head of the drum shall be permanently marked to show manufacturer's batch number and date of manufacture. When 5 percent polyisobutylene or butyl rubber has been added (see 3.1) the symbol "5P" or "5BR" shall be included in the marking.

3.6 **Drums furnished as filled containers.** When drums are furnished as filled containers the closure and packing shall be in accordance with the requirements of the appendix of this specification. The drums and closures shall not interact physically or chemically with the chemicals contained therein so as to be themselves altered or so as to alter the strength, quality, or purity of the contents of the containers beyond the requirements specified in the contract or order.

3.7 **Workmanship.** The drum shall be free from contamination (foreign matter) and damage such as cracks, dents, or deformation which would impair its use.

4. QUALITY ASSURANCE PROVISIONS

4.1 **Supplier's responsibility.** Unless otherwise specified herein, the supplier is responsible for the performance of all inspection requirements prior to submission for Government inspection and acceptance. Except

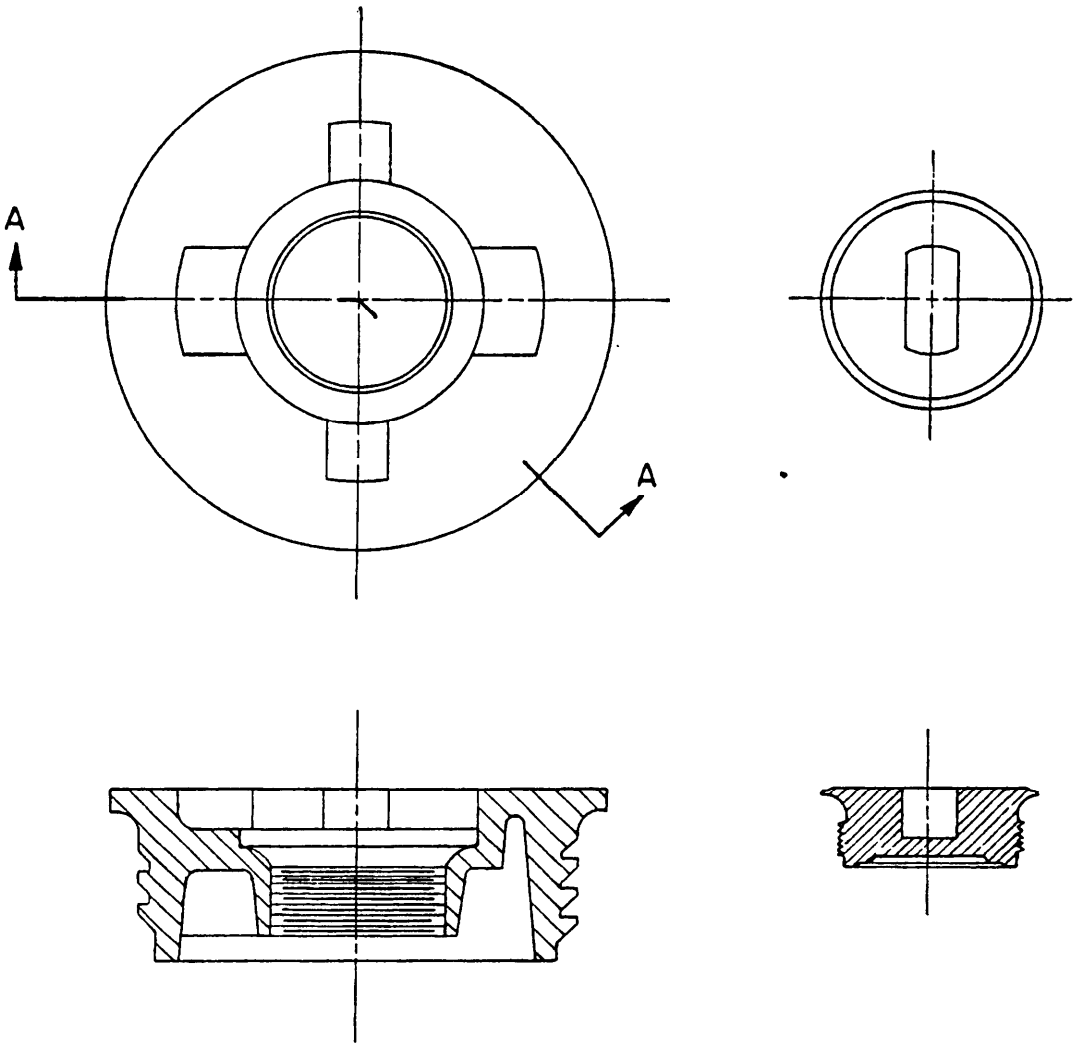


FIGURE 4. *Plugs.*

as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. Inspection records of the examinations and tests shall be kept complete and available to the Government as specified in the contract or order.

4.2 **Objective evidence.** The supplier shall present objective evidence as required by the Government representative that all material and components are in accordance with 3.1 and section 5 (see 6.3).

4.3 **Alternate inspection (including testing) procedures.** The supplier may utilize any alternate inspection procedures which will assure equal or better quality by submitting a written proposal with justification and obtaining written approval from the Government prior to its institution. In case of dispute, the procedures of this specification will govern.

4.4 **Inspection provisions.**

4.4.1 *Regular production lot.* A regular

production lot shall consist of the drums of one style and size, produced by one manufacturer, from the same material and under essentially the same manufacturing conditions and offered for delivery at one time.

4.4.2 *Sampling.*

4.4.2.1 *Nondestructive examination.* Sampling for nondestructive examination shall be conducted in accordance with Standard MIL–STD–105 using inspection level II, except the maximum sample size under normal inspection shall not exceed 50 drums, with the lot size expressed in units of drums.

4.4.2.2 *For test.* Sampling for tests shall be in accordance with Standard MIL–STD–105 using inspection level L–4 with the lot size expressed in units of drums.

4.4.3 *Examination and tests.*

4.4.3.1 *Examination.* Sample drums shall be examined in accordance with the classification of defects and with Standard MIL–STD–105.

4.4.3.2 *Tests.* The sample drums taken in accordance with 4.4.2.2 shall be tested in accordance with 4.5.1 and accepted at an AQL of 2.5 percent defective using Standard MIL–STD–105.

4.4.4 *Classification of defects.*

4.4.4.1 *Drums, polyethylene* (table I and II).

Categories and defects

Major—AQL 1.0 percent defective

1. Style or size incorrect.
2. Sidewall, bottom and top head thickness (min.) incorrect.
3. Dimensions incorrect.
4. Component missing, incorrect, or incorrectly assembled.
5. Threads incorrect.
6. Damage (see 3.7).
7. Contamination (see 3.7).

4.4.4.2 *Preparation for delivery* (sec. 5).

Categories and defects

Major—AQL 6.5 percent defective

1. Shipping container incorrect.
2. Shipping container closure incorrect.
3. Marking missing, incorrect, or illegible.
4. Shipping container damaged.

4.5 **Tests.**

4.5.1 *Leakage.* The drum or drums selected for testing shall be filled with water which has been strongly colored with ink or other suitable agent which is not a permeator of polyethylene and a 1/10 of 1.0 percent aerosol OT shall also be added to the water as a wetting agent. Cutout seals shall be removed and plugs screwed down and tightened with a torque of 150 ± 5 inch-pounds. The drums shall then be tested as specified in 4.5.1.1 and 4.5.1.2. Tests shall be conducted at room temperature with water at room temperature.

4.5.1.1 *Drop.*

4.5.1.1.1 *Style A drum.* Style A drum, each packed in a shipping container in accordance with the appendix of this specification, shall be drop tested in accordance with ASTM method D775–47, procedure B, with 4-foot drops, modified as follows: Cornerwise drops, with the face having the closure designated as surface 6, shall be made at points 2, 3, 5; 1, 4, 5; 1, 6, 2; and 3, 4, 6. One flatwise drop shall be made on surface 5, and one flatwise drop shall be made on any one of the surfaces 1, 2, 3, or 4. Following the tests, the drum shall be examined for evidence of leakage.

4.5.1.1.2 *Style B drum.* Style B drum, each packed in a steel container in accordance with the appendix of this specification, shall

be tested in accordance with ASTM method D997–05, with 4-foot drops, modified as follows: Size 1 drum shall be subjected to 4 diagonal bottom chine drops, one each at the points 2, 4, 6, and 8. Size 1 drum shall then be subjected to two flatwise sidewall drops on the lines 12 and 56 or on 34 and 78. Size 2, 3, and 4 drums shall be tested in the same manner as size 1, except that there shall be only one diagonal bottom chine drop on sizes 2, 3, and 4 and one flatwise sidewall drop on sizes 2 and 3. Size 4 drum shall not be flatwise drop tested. Following the drop test, the drums shall be examined for evidence of leakage.

4.5.1.2 *Closure.* Drums which pass tests specified in 4.5.1.1 shall be additionally tested as follows: The drum shall be laid on its side with the closure under test being at the lowest possible point. The drum shall be left in this position for not less than 30 minutes, at the end of which time the closure area shall be examined for evidence of leakage. On drums having two closures, the test shall be made on both closures.

5. PREPARATION FOR DELIVERY

5.1 Packing.

5.1.1 *Level B.* On direct shipment to the Government, unfilled polyethylene drums shall be packed as specified in the appendix to this specification except that plugs and screwcaps shall be closed in accordance with the manufacturer's commercial practice.

5.1.2 *Level C.* Unfilled polyethylene drums shall be packed in accordance with the manufacturer's commercial practice, when adequate to provide protection against damage during direct shipment from the supply source to the first receiving activity for immediate use. Shipping containers and packing shall comply with Uniform Freight Classification Rules or other carrier regulations without any penalty charges.

5.2 Marking. In addition to any special marking required by the contract or order, all shipments shall be marked in accordance with Standard MIL–STD–129.

6. NOTES

6.1 Intended use. Polyethylene drums covered by this specification are intended for use as containers for liquids, powders, or pastes. They are not intended for use with strong oxidizing liquids or aromatic or aliphatic hydrocarbons but, as indicated in table III, are suitable for some organic and inorganic acids, alcohols, and alkalies. In all cases the chemical should not be packaged in the polyethylene drum if the boiling point of the chemical approximates or is lower than the anticipated storage temperature. The following chemicals (see table III) have been shipped and stored in polyethylene drums. Table III is included for information only. Use of table III shall not in any way affect suppliers responsibility for compliance with the requirements of 3.6.

TABLE III. *Chemicals shipped and stored in polyethylene drums*

See note	Material	ICC regulated	Not ICC regulated
1	Acetaldehyde	X	
3	Acetamide		X
1	Acetic Acid, Glacial		X
1	Acetic Anhydride		X
3	Acetone	X	
1	Acryllic Acid, Glacial	X	
3	Alcohol, Allyl		X
3	Alcohol, Amyl		X
3	Alcohol, Butyl		X
3	Alcohol, Cetyl		X
3	Alcohol, Ethyl	X	
3	Alcohol, Furfuryl		X
3	Alcohol, N-Hexyl		X
3	Alcohol, Isopropyl	X	
3	Alcohol, Methyl	X	
3	Alcohol, N-Propyl		X
3	Alum		X
3	Aluminum Ammonium Sulfate		X
3	Aluminum Bromide (Sat. Aq.)		X
3	Aluminum Chloride		X
3	Aluminum Fluoride		X
3	Aluminum Formate Solutions		X
3	Aluminum Hydroxide		X
3	Aluminum Oxide		X
3	Aluminum Potassium Sulfate		X
3	Aluminum Sulfate		X
3	Ammonia	X	
3	Ammonium Aluminum Sulfate		X
3	Ammonium Bicarbonate		X
3	Ammonium Bifluoride		X
3	Ammonium Carbonate		X
3	Ammonium Chloride		X
3	Ammonium Hydroxide		X
3	Ammonium Metaphosphate		X
3	Ammonium Molybdate		X
3	Ammonium Nitrate	X	
3	Ammonium Oxalate		X
3	Ammonium Perchlorate	X	
3	Ammonium Persulfate		X
3	Ammonium Picrate	X	
3	Ammonium Phosphate		X
3	Ammonium Sulfate		X
3	Ammonium Sulfide		X
3	Ammonium Sulfocyanide	X	
3	Ammonium Thiocyanate		X
3	Ammonium Thiosulfate		X
3	Amtimony Chloride	X	
3	Antimony Sulfide	X	
3	Arsenic Acid	X	
3	Arsenic Disulfide	X	
3	Arsenic Trisulfide	X	
3	Arsenic Trichloride	X	
3	Arsenic Trioxide	X	

TABLE III. *Chemicals shipped and stored in polyethylene drums*—Continued

See note	Material	ICC regulated	Not ICC regulated
3	Barium Carbonate		X
3	Barium Chloride	X	
3	Barium Chromate	X	
3	Barium Hydroxide	X	
3	Barium Nitrate	X	
3	Barium Oxalate	X	
3	Barium Peroxide	X	
3	Barium Stearate		X
3	Barium Sulfate		X
3	Barium Sulfide		X
3	Benzenesulfonic Acid		X
3	Benzoic Acid		X
3	Bismuth Carbonate		X
3	Borax		X
3	Boric Acid		X
3	Boron Trifluoride	X	
3	Calcium Acetate		X
3	Calcium Bisulfite		X
3	Calcium Carbide		X
3	Calcium Carbonate		X
3	Calcium Chlorate		X
3	Calcium Chloride		X
3	Calcium Fluoride		X
3	Calcium Hydroxide		X
3	Calcium Hypochlorite		X
3	Calcium Nitrate		X
3	Calcium Oxalate		X
3	Calcium Oxide		X
3	Calcium Phosphate		X
3	Calcium Phosphide		X
3	Calcium Resinate		X
3	Calcium Silicide		X
3	Calcium Stearate		X
3	Calcium Sulfate		X
3	Carbazole		X
3	Carbolic Acid	X	
2	Chromic Acid, 35 percent	X	
3	Citric Acid		X
3	Compounds, Cleaning Liquid, not over 60 percent Hydrofluoric Acid	X	
3	Copper Sulfate		X
3	Cresol		X
3	Cupric Carbonate		X
3	Cupric Chloride		X
3	Cupric Nitrate		X
3	Cupric Oxide		X
3	Cupric Sulfate		X
2	Chromate Solution (Mixed)	X	
3	Cuprous Oxide		X
3	Cyclohexanol	X	
1	Detergents, Synthetic, Nonionic		X
3	Dextrose		X
3	Diethylene Glycol		X
3	Difluorphosphoric Acid	X	
3	Dimethyl Formamide		X

TABLE III. *Chemicals shipped and stored in polyethylene drums*—Continued

See note	Material	ICC regulated	Not ICC regulated
3	Ethyl Acetoacetate		X
3	Ethylene Diamine	X	
3	Ethyl Lactate		X
3	Ethylene Glycol		X
3	Ethoxypropionic Acid		X
3	Ferric Ammonium Citrate		X
3	Ferric Ammonium Oxalate		X
3	Ferric Ammonium Sulfate		X
3	Ferric Chloride		X
3	Ferric Sulfate		X
3	Ferro Chrominum		X
3	Ferro Manganese		X
3	Ferro Molybdenum		X
3	Ferro Silicon		X
3	Ferro Sulfide		X
3	Ferrous Ammonium Citrate		X
3	Ferrous Chloride	X	
3	Ferrous Sulfate		X
3	Fixing Solutions, Photographic		X
3	Fluophosphoric Acid	X	
3	Fluosilicic Acid	X	
3	Formaldehyde		X
3	Formamide		X
3	Formic Acid	X	
3	2-Furaldehyde		X
3	Gallic Acid		X
3	Glycerine		X
3	Glycerol		X
3	Hydrazine, 30 percent	X	
3	Hydrobromic Acid, 50 percent	X	
3	Hydrochloric Acid	X	
3	Hydrocyanic Acid	X	
3	Hydrofluoric Acid, 60 percent	X	
3	Hydrogen Peroxide, 37 percent	X	
3	Hydroquinone		X
3	Lactic Acid		X
3	Lauroryl Peroxide	X	
3	Lead Acetate	X	
3	Lead Arsenate	X	
3	Lead Chromate		X
3	Lead Nitrate	X	
3	Lead Peroxide	X	
3	Lead Stearate		X
3	Lead Thiocyanate		X
3	Lithium Bromide	X	
3	Lithium Hydroxide	X	
3	Magnesium Carbonate		X
3	Magnesium Chloride		X
3	Magnesium Hydroxide		X
3	Magnesium Iodide		X
3	Magnesium Nitrate	X	
3	Magnesium Oxide		X
3	Magnesium Sulfate		X
3	Malic Acid		X
3	Manganese Carbonate		X

TABLE III. *Chemicals shipped and stored in polyethylene drums*—Continued

See note	Material	ICC regulated	Not ICC regulated
2	Mercury	X	
2	Mercuric Chloride	X	
2	Mercuric Cyanide	X	
2	Mercuric Iodine Solutions	X	
2	Mercurous Nitrate	X	
3	Methylsulfuric Acid		X
3	Molybdic Acid		X
3	Nickel Ammonium Sulfate		X
3	Nickel Chloride		X
3	Nickel Nitrate		X
3	Nickel Sulfate		X
1	Nitric Acid, 10 percent	X	
3	Nitrocellulose	X	
3	Oleic Acid		X
3	Oxalic Acid		X
3	Palmitic Acid		X
3	Phenol	X	
3	Phosphoric Acid		X
3	Phosphoric Anhydride		X
3	Phosphorus	X	
3	Phosphorous Pentoxide	X	
3	Picric Acid	X	
3	Potassium Acid Sulfate	X	
3	Potassium Bicarbonate		X
3	Potassium Bichromate		X
3	Potassium Bisulfate		X
3	Potassium Bisulfite		X
3	Potassium Borate		X
3	Potassium Bromate	X	
3	Potassium Bromide	X	
3	Potassium Carbonate		X
3	Potassium Chlorate	X	
3	Potassium Chloride		X
3	Potassium Chromate		X
3	Potassium Cuprocynanide	X	
3	Potassium Cyanide	X	
3	Potassium Dichromate		X
3	Potassium Ferri-Ferro Cyanide	X	
3	Potassium Fluoride	X	
3	Potassium Hydroxide	X	
3	Potassium Iodide	X	
3	Potassium Nitrate	X	
3	Potassium Perborate	X	
3	Potassium Perchlorate	X	
3	Potassium Permanganate	X	
3	Potassium Phosphate		X
3	Potassium Picrate	X	
3	Potassium Sulfate	X	
3	Potassium Sulfide	X	
3	Potassium Sulfite	X	
3	Potassium Thiosulfate	X	
1	Propionic Acid		X
3	Propylene Glycol		X
3	Resorcinal		X
3	Salicylic Acid		X

TABLE III. *Chemicals shipped and stored in polyethylene drums*—Continued

See note	Material	ICC regulated	Not ICC regulated
1	Silicone Emulsions		X
3	Silver Cyanide	X	
3	Silver Nitrate	X	
3	Sodium Acetate		X
3	Sodium Aluminum Sulfate		X
3	Sodium Benzoate		X
3	Sodium Bicarbonate		X
3	Sodium Bisulfate		X
3	Sodium Bisulfite		X
3	Sodium Bitartrate		X
3	Sodium Borate		X
3	Sodium Bromide		X
3	Sodium Carbonate		X
3	Sodium Chlorate	X	
3	Sodium Chloride		X
3	Sodium Cyanide	X	
3	Sodium Dichromate		X
3	Sodium Ferro Cyanide		X
3	Sodium Fluoride		X
3	Sodium Formate		X
3	Sodium Hydroxide	X	
3	Sodium Hypersulfate		X
1	Sodium Hyposulfite		X
3	Sodium Metaborate		X
3	Sodium Metaphosphate		X
3	Sodium Metasilicate		X
3	Sodium Nitrate	X	
3	Sodium Nitrite	X	
3	Sodium Orthosilicate		X
3	Sodium Oxalate		X
3	Sodium Perborate		X
3	Sodium Phosphate		X
3	Sodium Silicate		X
3	Sodium Sulfate		X
3	Sodium Sulfide	X	
3	Sodium Sulfite		X
3	Sodium Tetraborate		X
3	Soldering Fluxes		X
1	Stannic Chloride		X
3	Stannous Chloride		X
3	Starch		X
3	Stearic Acid		X
3	Strontium Oxalate	X	
3	Strontium Peroxide	X	
3	Strontium Tartrate	X	
3	Succinic Acid Peroxide (wet)		X
3	Sulfamic Acid		X
3	Sulfites Liquors		X
3	Sulfur		X
3	Sulfur Trioxide	X	
3	Sulfuric Acid, Electrolyte (for storage batteries)	X	
3	Sulfuric Acid, 60 percent	X	
3	Tannic Acid		X
3	Tartaric Acid		X

TABLE III. *Chemicals shipped and stored in polyethylene drums*—Continued

See note	Material	ICC regulated	Not ICC regulated
3	Triethylene Glycol		X
3	Trisodium Phosphate		X
3	Urea		X
3	Water		X
3	Zinc Borate		X
3	Zinc Carbonate		X
3	Zinc Chloride		X
3	Zinc Chromate		X
1	Zinc Cyanide	X	
3	Zinc Fluoride		X
3	Zinc Nitrate		X
3	Zinc Oxide		X
3	Zinc Stearate		X
3	Zirconium Acetate Solutions		X
3	Zirconium Nitrate		X

Note. 1. Must be packaged in polythylene — polyisobutylene or polyethylene-butyl rubber blend as specified in 3.1.
2. Must be packaged in polyethylene with no polyisobutylene, or butyl rubber.
3. May be packaged in containers of polyethylene blended as in 1 or unblended as in 2.

6.2 Ordering data. Procurement documents should specify the following:

(a) Title, number, and date of this specification.

(b) Style, size, and class of drum (see 1.2).

(c) Type and size of closures required on sizes 2, 3, and 4 (see 3.2.2) if other than buttress-type threads and 2-inch flanged openings are desired.

(d) Five percent polyisobutylene or butyl rubber additive when required (see 3.1).

(e) Reuse marking when required (see 50.1).

6.3 Objective evidence. Provisions for objective evidence and inspection records, and maintenance of inspection records will be specified by the procuring activity.

6.4 Ultraviolet rays. Polyethylene drums should be protected from exposure to sunlight (ultraviolet rays). Ultraviolet rays excellerate the aging of polyethylene.

Custodians:
Army—Chemical Corps
Navy—Bureau of Supplies and Accounts
Air Force

Preparing activity:
Army—Chemical Corps

APPENDIX

REQUIREMENTS FOR CLOSURE AND PACKING OF FILLED CONTAINER

10. SCOPE

10.1 This appendix covers requirements for closing and packing of filled polyethylene drums.

10.2 Unless otherwise specified by the procuring activity, filled containers shall be closed and packed in accordance with this appendix.

10.3 Exterior shipping containers for filled polyethylene drums shall be as follows:

Style A Cubical Drums:
Wood fiberboard lined box.
Fiber box.

Style B Cylindrical Drums:
Type I Steel Drum — Flange exposed (see fig. 5, 6, 7, 8, and 11).
Type II Steel Drum—Drum fully enclosed (see fig. 9 and 10).

20. APPLICABLE DOCUMENTS

20.1 Government documents. The following documents of the issue in effect on date of invitation for bids, form a part of this appendix:

SPECIFICATIONS

FEDERAL

PPP-D-760 — Drums and Pails, Metal (5 and 16.64 Gallon).

MILITARY

MIL-B-138 — Boxes, Wood, Fiberboard — Lined for Overseas Shipment (For Weight of Contents Not Exceeding 500 Pounds).

20.2 Other publications. The following documents form a part of this appendix. Unless otherwise indicated, the issue in effect on date of invitation for bids shall apply.

INTERSTATE COMMERCE COMMISSION

49 CFR 71-90. Interstate Commerce Commission Rules and Regulations for the Transportation of Explosives and Other Dangerous Articles.

(The Interstate Commerce Commission regulations are now a part of the Code of Federal Regulations (Rev. 1956) available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Orders for the above publication should cite "49 CFR 71-90 (Rev. 1956.")

CONSOLIDATED CLASSIFICATION COMMITTEE

Uniform Freight Classification Rules.

(Applications for copies of these freight classification rules should be adressed to the Consolidated Classification Committee, 202 Chicago Union Station, Chicago 6, Ill.)

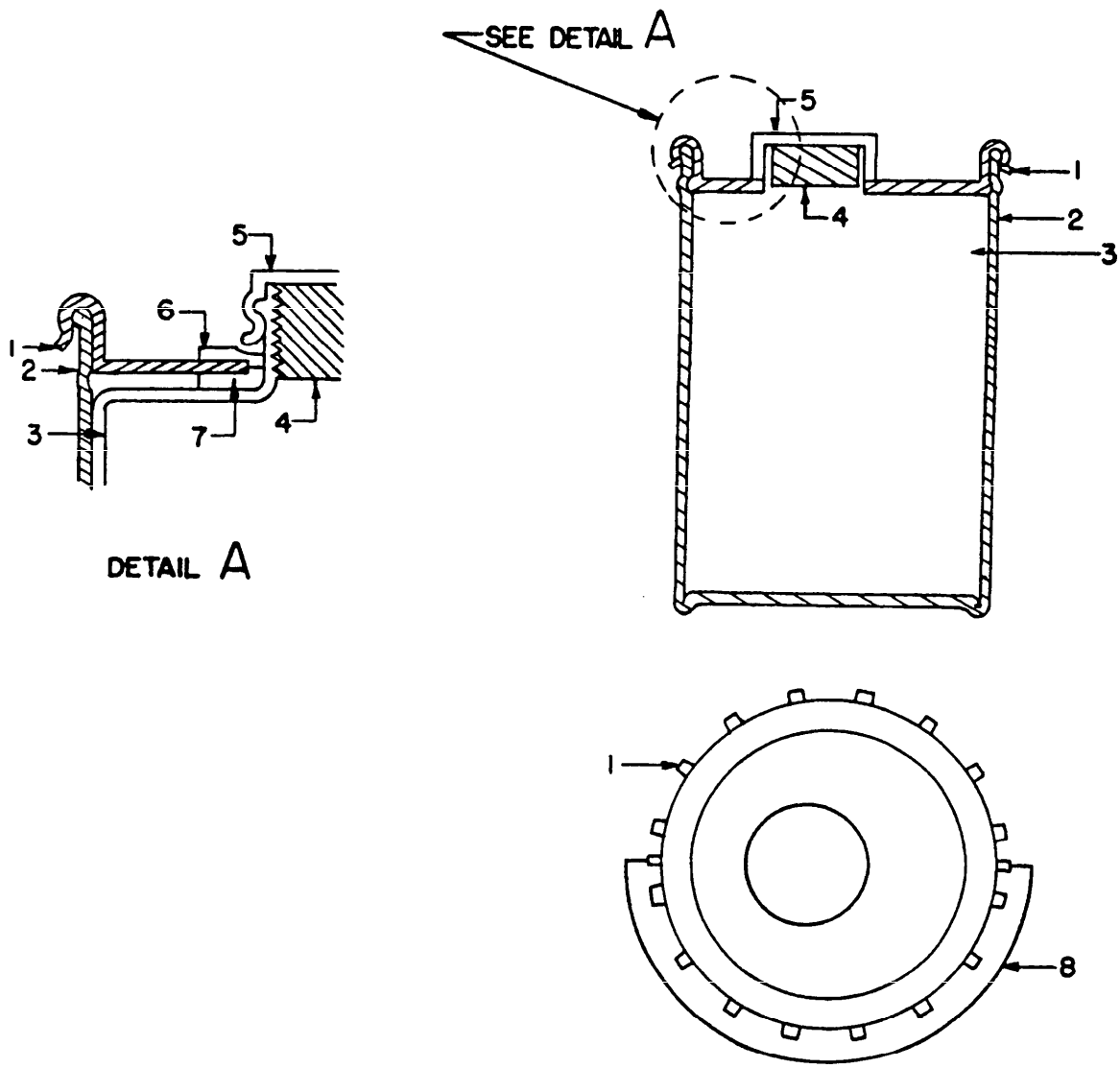
30. CLOSURE

30.1 Polyethylene drums. Closure of the filled polyethylene drums shall be accomplished as follows:

30.1.1 *Flange and plug closures.* Plugs shall be secured by use of a handtool with a minimum of 12.5 foot-pounds torque.

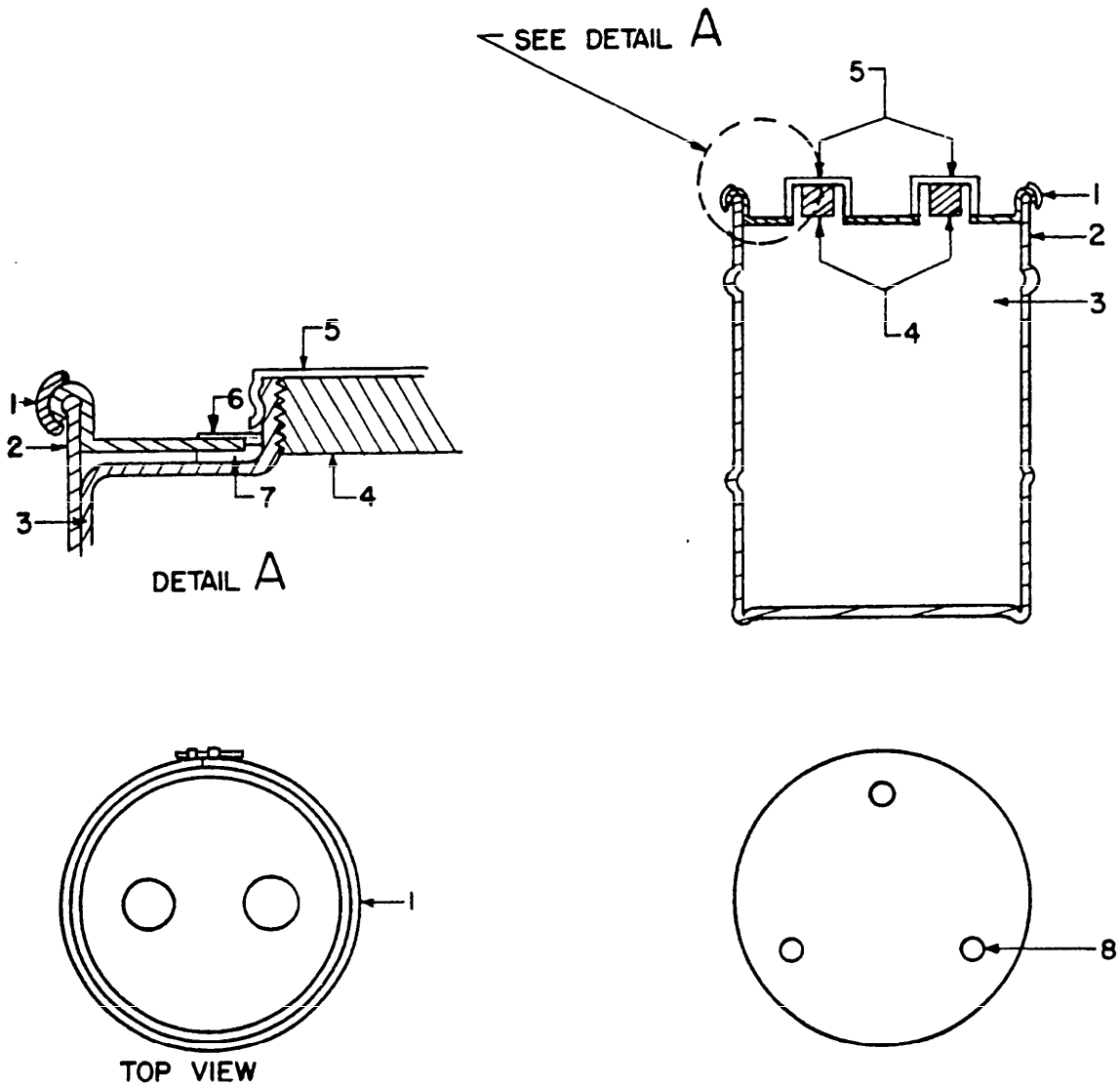
30.1.2 *Screwcap closures.* Screwcaps shall be secured by automatic mechanical means or by cap wrenches. Handtightening will not be permitted.

30.2 Steel drums. Closure of type I and type II steel drums for packing filled, style



1. LUGS
2. STEEL PAILS
3. POLYETHYLENE DRUMS
4. POLYETHYLENE PLUGS
5. OUTER CAPS
6. RETAINING RINGS
7. UNDERGUARD
8. HANDLE

FIGURE 5. *Size 1—style B.*



1. LOCK RING
2. STEEL DRUM
3. POLYETHYLENE DRUM
4. POLYETHYLENE PLUGS
5. OUTER CAPS
6. RETAINING RINGS
7. UNDER GUARDS
8. DRAIN HOLE

FIGURE 4. *Type I—style B—size 2, 3, 4.*

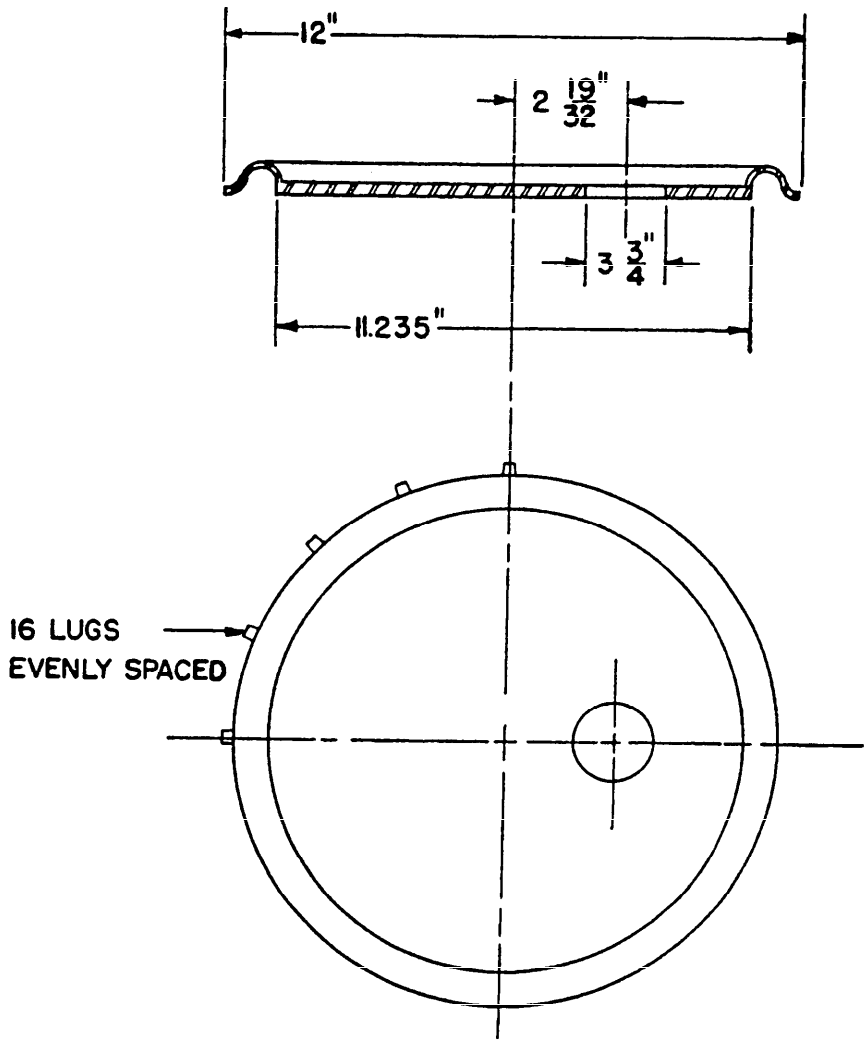
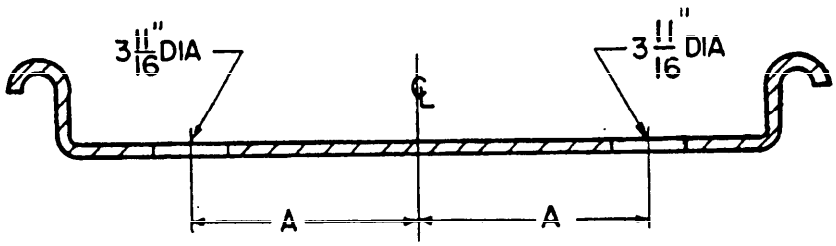
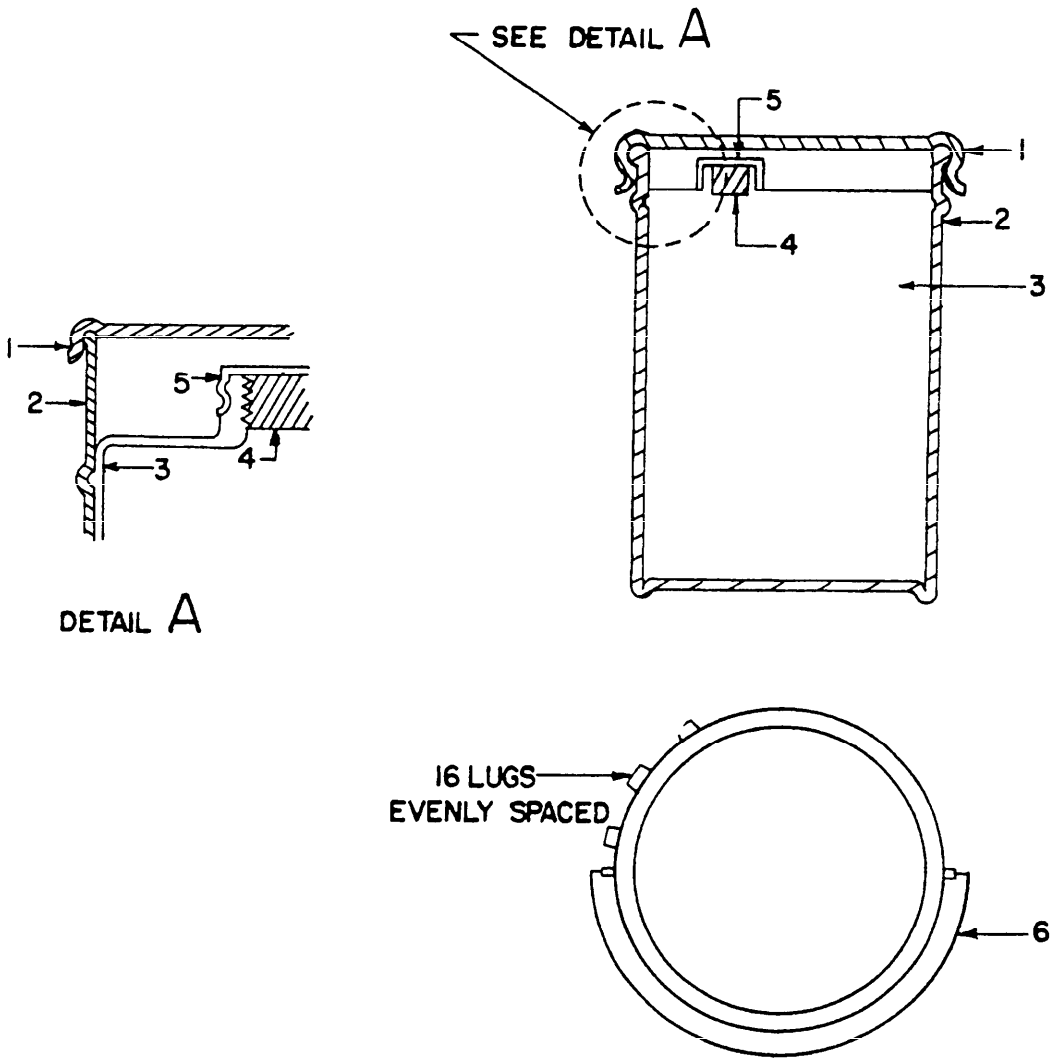


FIGURE 7. *Steel pail head opening for type I overpack (see 40.1.2.1).*



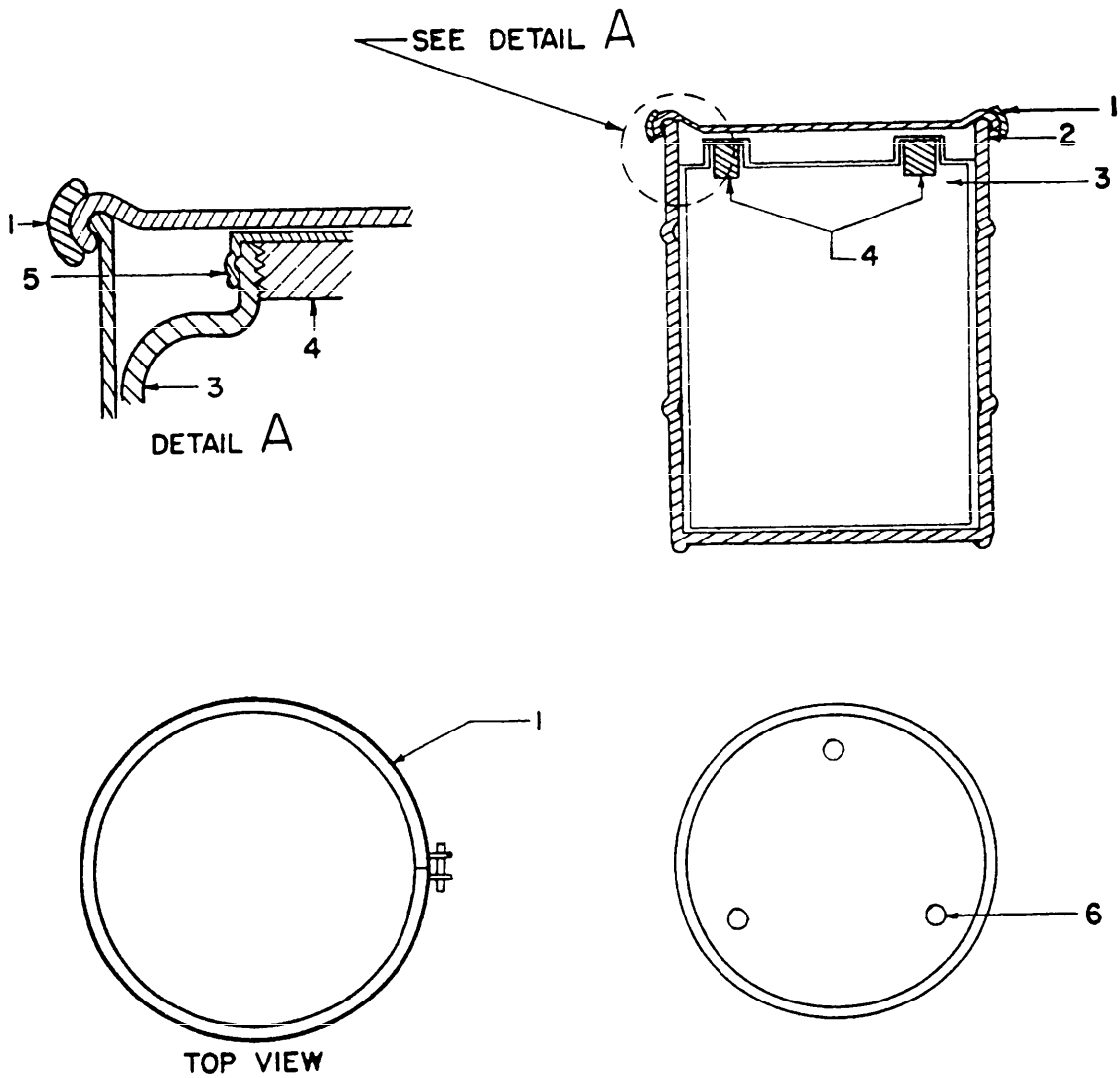
	A
15 GAL	4 19/32"
30 GAL	6 1/4"
55 GAL	8 7/16"

FIGURE 8. *Steel drumhead openings for type I overpack (see 40.1.2.1.2.1).*



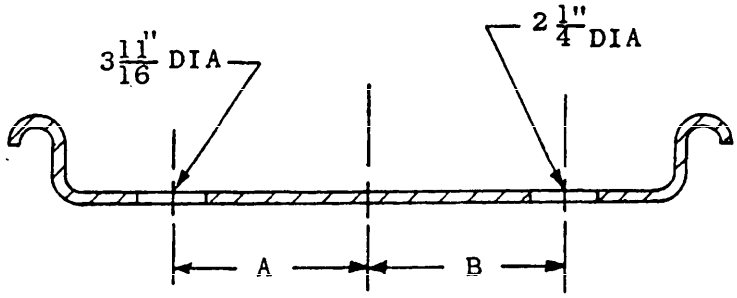
1. LUGS
2. STEEL PAIL
3. POLYETHYLENE DRUM
4. POLYETHYLENE PLUG
5. OUTER CAP
6. HANDLE

FIGURE 9. *Type II—style B—size 1.*



1. LOCK RING
2. STEEL DRUM
3. POLYETHYLENE DRUM
4. POLYETHYLENE PLUGS
5. OUTER CAPS
6. DRAIN HOLE

FIGURE 10. *Type II—style B—size 2, 3, 4.*



	SIZE	A	B
15	2 A	4 19/32"	5 3/32"
15	2 B	3 15/16"	4 7/16"
30 GAL	3	6 1/4"	6 13/16"
55 GAL	4	8 7/16"	8 3/4"

FIGURE 11. *Steel drumhead opening for type I overpack (see 40.1.2.1.2.2).*

B, polyethylene drums shall be accomplished as follows:

30.2.1 *Bolted ring covers.* Bolted ring covers shall be secured sufficiently tight to withstand multiple long distance shipments.

30.2.2 *Lug covers.* Lug covers shall be secured by a tool specifically designed to accomplish closure on this type of container. Hand pliers, hammering or other improvised means will not be permitted.

40. EXTERIOR PACKING

40.1 **Level A.**

40.1.1 *Style A polyethylene drums.* Style A polyethylene drums shall be packed in fiberboard lined wood boxes conforming to type II, style 2 or 2½ of Specification MIL-B-138.

40.1.2 *Style B polyethylene drums.* Style B polyethylene drums shall be packed in type I or type II steel drums (see 10.3).

40.1.2.1 *Type I.*

40.1.2.1.1 *Size 1.* Type I exterior steel container for size 1 polyethylene drums shall conform to type II, class 1 of Specification PPP-D-760, except that the head shall have one hole of sufficient diameter to accommodate the protruding flange of the polyethylene drum (see fig. 7). Height of the

steel container shall be modified as required to make a snug fit.

40.1.2.1.2 *Sizes 2, 3, and 4.* Type I exterior steel drums for sizes 2, 3, and 4 polyethylene drums shall conform to Specification 5B or 6J of the Interstate Commerce Commission regulations with the exception shown in paragraphs 40.1.2.1.2.1 and 40.1.2.1.2.2. In addition, polyethylene retaining rings shall be used so as to keep the polyethylene flanges fastened and locked securely to the head of the steel drum. A neoprene rubber gasket shall be placed under the metal head of the drum and around the polyethylene flange.

40.1.2.1.2.1 The heads of the steel drums used to contain polyethylene drums having two 2-inch flanged openings (see 3.2.2.1.1) shall be modified to have openings as shown on figure 8.

40.1.2.1.2.2 The heads of the steel drums used to contain polyethylene drums having one 2-inch flanged opening and one ¾-inch flanged opening (see 3.2.2.1.1) shall be shown in figure 11.

40.1.2.2 *Type II.*

40.1.2.2.1 *Size 1.* Type II exterior steel container for size 1 polyethylene drums shall conform to type II, class 1 of Specification PPP-D-760. Height of the steel container shall be modified as required to make a snug fit.

40.1.2.2.2 *Sizes 2, 3, and 4.* Type II exterior steel drums for sizes 2, 3, and 4 polyethylene drums shall conform to Specification 5B or 6J of the Interstate Commerce Commission Regulations.

40.2 **Level B.** Packing for level B shall be the same as for level A except that style A polyethylene drums shall be packed in type I or type II, class 1 fiberboard boxes conforming to Specification PPP-B-636.

40.3 **Quality assurance provisions.** The closure and packing of filled containers shall be examined to determine compliance with the requirements of this appendix. Sampling and examination shall be in accordance with Standard MIL-STD-105, using an AQL of 4.0 percent defective.

50. MARKING

50.1 When specified by the contract or order, steel drums shall contain the following marking:

> "This drum contains a polyethylene drum and is reusable provided the drum including its closing device and the polyethylene inner drum is in such condition that it will hold its contents as adequately as a new container."

In addition to any special marking required by the contract or order, exterior shipping containers shall be marked in accordance with Standard MIL STD-129.

60. NOTES

60.1 **Reuse of containers.** Steel drums may be reused provided the drums (including their closing devices) are in such condition that they will hold their contents as adequately as new containers.

60.2 **Exception.** Gross weight limitations that are embossed in steel drums may be waived to the extent that full carrying capacity of the container shall be utilized.